

REMARKS

In response to the Official Action mailed February 28, 2003, Applicant requests continued examination and amend his application. No claims are added or cancelled in this Amendment so that claims 1, 4-7, and 9 remain pending.

In the Official Action, reference was made to claim 9. However, claim 9 had previously been cancelled. An error occurred at page 1 of the previous response that may have led to confusion. In that error, claim 9 was not referred to and claim 8 was inadvertently twice referred to in the list of cancelled claims.

All previously examined claims were rejected as unpatentable over the prior art described in the patent application (APA) in view of Ono (JP 8-186117). This rejection is inapplicable to the claims now pending.

Figures 8-15 of the patent application illustrate a wire bonding method and a wire bonding structure. In the structure illustrated, a bonding wire 1 extends from a first ball 2 on an inner lead 10 to a second connection. The second connection is between the bonding wire 1 and a stud bump 9 that is disposed on a bonding pad 6, which is, in turn, located on a semiconductor chip 7. There is no direct connection or contact between the bonding wire 1 and the bonding pad 6. This arrangement is different from the structure claimed in claims 1 and 4-6, which require a direct connection between the bonding wire and the bonding pad.

Of course, in addition, in the claimed structure, the bonding wire also includes a reverse bend so that two different parts of the bonding wire constitute respective layers of the bonding wire that lie directly on each other. An example of that reverse bending arrangement is illustrated in each of Figures 4 and 6 of the patent application.

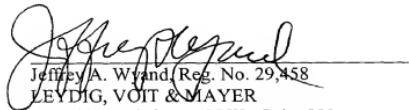
Ono, particularly its Figures 3(a)-3(f), was relied upon in the rejection. Presumably the Examiner is of the view that the step illustrated in Figure 3(d) of Ono produces two layers of the bonding wire 4 as in claim 1. Accepting, solely for the sake of argument, that interpretation, Ono still does not provide sufficient disclosure to bridge the difference between claim 1 and the APA. The second end of the bonding wire 4 of Ono is not directly connected to a bonding pad as in the claimed invention, but is actually severed in the step illustrated in Figure 3(e) of Ono. Thus, Ono provides no information concerning an important limitation of claims that is not present in the APA. Stated another way, no combination of the APA and Ono can establish *prima facie* obviousness of amended claim 1 and its dependent claims 4-6 because the combination cannot include all of the elements of the claimed invention.

In re Appln. of Hideyuki ARAKAWA
Application No. 09/934,643

Claim 7 is a method claim that has similarities to the apparatus claim 1. In the method of claim 7, a ball at the end of a bonding wire is first joined to a conductive layer. Then, a first part of the bonding wire, extending from the ball, is *directly* joined to a bonding pad. There is no possibility of joining to an intermediate stud bump as in the prior art structure and method described in the patent application. Then, a second part of the bonding wire is deformed so that layers of the bonding wire are formed by folding of the bonding wire. One of those layers is joined to the other layer. Again, nothing similar is described in the prior art of the patent application where there is always a stud bump preventing direct contact of the wire with the bonding pad. Further, there is no explanation in Ono as to where and how the remote end of the wire is connected, unlike the method of claim 7. Thus, *prima facie* obviousness of claims 7 and 10 cannot be demonstrated by any combination of the APA and Ono.

Reconsideration and allowance of the claims now pending are appropriate and earnestly solicited.

Respectfully submitted,


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